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(12) **United States Patent**  
**Landau**

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(54) **SINGLE-USE NEEDLE-LESS HYPODERMIC JET INJECTION APPARATUS AND METHOD**

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(\*) **Notice:** This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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#### Related U.S. Application Data

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(51) **Int. Cl.<sup>7</sup>** ..... A61M 5/30; A61M 37/00

(52) **U.S. Cl.** ..... 604/68; 604/69; 604/143

(58) **Field of Search** ..... 604/68-72, 140, 604/141, 143, 148, 232, 131

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(57) **ABSTRACT**

A gas-powered, single-use, needle-less hypodermic jet injection device includes a hand-held injector, and a drug injection cartridge which provides a cylinder of liquid medication to be injected, an injection orifice, and an injection piston. Forceful movement of the injection piston in the cylinder causes an injection jet of medication to be expelled from the injection orifice. The injection device also includes a hermetically sealed gas pressure capsule which remains sealed until the moment of injection and powers the jet injection after opening of this cartridge.

**20 Claims, 4 Drawing Sheets**

